

# New and Interesting Facts from Science and Life

## TAPPING the Skulls of MANIACS Latest Discovery That SOFTENING of the BRAIN Is Produced by a MICROBE to Learn CAUSE of PARESIS

By boring through the skulls of madmen, victims of paresis, or softening of the brain, and extracting from each a quantity of brain matter, Dr. U. J. Wile, a professor in the medical school of the University of Michigan, has made the wonderful discovery that this baffling, incurable and dreadful disease that dethrones the reason is caused by a microbe. The world of science regards Dr. Wile's discovery as one of the great achievements of the present century.

In his remarkable experiments Dr. Wile inoculated rabbits with the diseased matter taken from the brains of lunatics, and the animals developed paresis. It is said that when the rabbits inoculated by Dr. Wile became infected the presence of the spirochaeta pallida was established and the cause of paresis in the patients determined. The claim is made that the resulting discoveries of the Michigan professor's experiments have an important bearing on the cure of paresis.

It is said that Dr. Wile's experiments, while making a great contribution to medical science in that they show plainly the cause of paresis, did not inconvenience the patients in any way, as the operation was absolutely painless. Dr. Wile and members of the medical profession justify his experiments solely in the interests of scientific advancement. The experiments Dr. Wile made on lunatics are described as follows:

The patient's head is first shaved and the anterior portion of the skull thoroughly painted with tincture of iodine.

The region is frozen with ethyl chloride, and a revolving dental drill is thrust quickly through the skin

and deeper tissues. A few rapid revolutions of the drill in the hands of an assistant suffice to pierce the skull.

The drill is then removed and a long, thin needle is inserted and pushed firmly and deeply into the cortex. A syringe barrel is attached to the end of the needle. By suction a small cylinder of brain substance containing both gray and white matter is drawn into the syringe.

Dr. Wile says that for his series of experiments six cases were chosen from a large number of paresis. The diagnosis from the clinical findings and from the spinal fluid was frank general paresis. All the cases had been under the observation of Dr. Edmund A. Christian at the Pontiac State Hospital.

Surgeons say that in performing this operation Dr. Wile had only to take care to avoid the cerebral and meningeal vessels, and that over the upper frontal region, well away from the middle line, danger is not encountered, nor is any important center disturbed. It is said that in all cases thus far examined practically no pain has been experienced.

In speaking on the subject of general paresis Dr. Joseph Collins of the Neurological Institute of New York city says:

"General paresis is a disease of the cerebrum and the central nervous system caused by the presence and growth of the spirochaeta pallida in its lymph system. The destructive action of these organisms is expended largely on the ganglion cells of the cortex of the brain. Any part of the nervous system may, however, be subject to its ravages, but the symptoms of the disease are always finally and conspicuously cerebral."

"It is a fatal disease. Once it is fully developed it is subject neither to amelioration nor to interruption."

"There is no encouragement from experience recent or remote to justify the hope that we shall be able



The Head Is First Shaved and Anterior Portion of Skull Painted with Iodine.

to cure general paresis until such time when we shall recognize the disease much earlier than we do now. I have studied the histories of 100 general paresis that have come under observation during the past six years to learn if there was anything in the clinical histories of these patients that would permit the physician who saw them early either to suspect the disease or to diagnose it with sufficient positiveness to subject them to treatment."

"That general paresis is a brain disease due to blood poisoning is now universally admitted. Some writers still teach that alcoholic and other excesses are important contributory factors to the causation of general paresis."

"My histories, now amounting to upward of 100, do not bear out the statement that excessive use of alcohol is even a contributory cause. Many patients in the early stages of general paresis give way to excessive indulgence in alcohol as an evidence of their mental disorder,



Region of Operation Is Anesthetized and Pierced with a Dental Drill.



A Hollow Needle with Syringe Barrel Is Inserted in Opening and Brain Matter Removed.



View of the Brain, the Central Nervous System Which Is Destroyed by Paresis.

often exists from the very onset. 'He does not realize or admit that he is sick' is a statement that we often hear."

"The course of the disease is a variable one: in a few instances it makes uniform progress, and the patient gets worse week by week. This variety makes up about 10 per cent. of the cases. Then there is about another 10 per cent. which makes partial recovery, that is, recovery which permits the patients to return to their profession or occupation. It is often difficult to convince the families of these patients that the cessation of activity of the disease is not equivalent to recovery."

"There is a large percentage of cases, namely, 20 per cent., in which truly remarkable progress is made. The disease being only fairly well marked or typically developed, the patients seem to be going along without very conspicuous change from day to day or from week to week, when suddenly they are seized with a series of convulsions, and all the symptoms of profound physical and mental disintegration. After a few days the patient will be up and about, and in about the same condition that he was before the attack, perhaps slightly deficient of insight or interest, or hypomanical, but distinctly further along the roadway of the disease."

"About half of the cases make steady progress, the clinical picture changing little from week to week, but the end of each succeeding year finds the patient worse. He usually succumbs within five years from the onset of the disease."

## How Drinking WATER Is PURIFIED

It is sometimes impossible to secure pure water for drinking and for domestic use. "In such a case," says Prof. A. W. Freeman, epidemiologist of the United States department of public health, "an impure water may be rendered safe for drinking by boiling or by the use of 'chloride of lime' (bleaching powder)."

"Heat kills all disease germs, and water, no matter how heavily infected, may be freed from infection by boiling. For practical use, the water should be boiled in considerable quantities in a wash boiler or other suitable vessel. The boiling should be continued for 20 minutes, and the vessel kept covered until the water is cool."

"The 'flat' taste of boiled water may be largely removed by thoroughly 'aerating' the water. This is done by dipping it up with a clean dipper and allowing it to run back and carry air bubbles down into the fluid."

"Where ice is not available for

cooling, boiled water may be cooled for drinking by covering a bottle or jug with several layers of flannel, and when the vessel is filled with the boiled water, wetting the cloth with water and hanging the vessel where the breeze will blow on it. The evaporation of the water from the flannel will cool the water inside the vessel to a pleasant temperature."

"While boiling is by far the safest method of destroying disease germs in water, it is troublesome and inconvenient. Chloride of lime solution may be used for the same purpose and, if used with care, is safe and efficient. The chloride of lime solution is prepared by dissolving one teaspoonful of fresh chloride of lime (bleaching powder) in one quart of water. This should be placed in a tightly stoppered bottle and kept away from light. To disinfect water, add one teaspoonful of the disinfectant solution so prepared to each two gallons of water, stir the water thoroughly and allow it to stand for 15 minutes. At the end of that time the disinfectant will have killed the disease germs and the water may be drunk with a fair degree of safety."

## Why ELECTRIC Light Bulbs GLOW

WHEN you heat iron in a forge it becomes either red hot or white hot, depending on how hot it is. It sends forth light. The hotter it is the more light it gives. Finally there comes a point where the iron melts away."

The best light-giving material is that which will melt at the highest temperature. Carbon is a material

which cannot be melted easily; but it burns up in the open air long before it reaches the melting point. Edison conceived the idea of making a little thread of carbon, of placing that thread in a bulb, and of heating it by the electric current to the highest possible point. In order to prevent the carbon filament from burning up he pumped out all the air in the bulb. The result was that the thread of carbon was heated to the glowing point, so that it gave a very bright light."

Tungsten is a metal which melts at the highest melting point. It ought to be the best light-producer, since it can be heated higher than any other metal without melting. The trouble is that tungsten is exceedingly brittle, so that a thread cannot easily be made of it. This difficulty was overcome about 12 years ago by making a paste of powdered tungsten and forming a thread of this paste. Later still a way was found of so treating the tungsten that it could be drawn into a hair-like thread a mile long if necessary. All modern electric incandescent lamps have such tungsten filaments. They consume very much less current than the older carbon-filament lamps.

## How You Can EASILY KEEP Yourself in the BEST Physical CONDITION

KEEP in training, Mr. Middle-aged Business Man, and it cannot but benefit both you and your business; for good health and spirits are essential to both. But, at the same time, beware of over-training! And here is given just the information you desire, whether you are keeping in good physical form or whether you have allowed yourself to lapse into the heavy, logy class and are now looking to escape from it by way of setting up exercises.

There is no reason why a man in fair health should ever go out of training at all. A laborer, compelled by the nature of his work to use his muscles all day, and by his scanty pay to live frugally, will keep himself strong at 70.

Moreover, it is just this class of more or less elderly men whom training most benefits, and who are most likely to be damaged by any relaxation of it. Youth is elastic, and any harm occasioned by a temporary departure from a strict regimen is quickly repaired by it. But in the case of a man no longer young, it is not.

Once let the well-trained muscles get slack, and they will either lay on adipose tissue which will take months of severe work to sweat off again, or they will begin to lose their tone and resilience, and take an irremediable step on the path toward degeneration. That this is the case with the visible muscles of the arms and legs is within the experience of many, but its most important effects are seen in the muscles of the trunk, especially of the abdomen and

loins, and in the heart, which is the greatest muscle of all.

The danger of suddenly returning at middle-age to the sports of one's youth without resuming training has, of late, been shown by more than one melancholy example.

Nor are field sports or exercise in the open air—useful as they always are—necessary to this end. Mechanical exercises, without the expenditure of time and money involved in games like golf, will do much; and although few will care to indulge in boxing or wrestling after the cape of 25 years is doubled, there is always fencing, which is in most ways an ideal game for the elderly.

How, now, should a man know when he is carrying training too far—or, in other words, is taking too much instead of too little exercise?

Dr. Georges Rosenthal, an ex-pres-

ident of the French Société de Kinésithérapie, has just supplied us with an easy means of discovering this.

If a man in the habit of taking regular exercise or indulging in active sport, at any age, finds himself becoming suddenly irascible or even anxious without assignable cause, let him slacken in his exercise.

If he then gets relief he will know that he has been doing too much, and, in consequence, must reduce in future his output of energy.

Or, if, with or without this symptom, he finds that loss of appetite and of sleep follow upon active exercise, he should interpret it in the same way, and take the same means of checking his diagnosis. If he does not do so, the probability is he will begin to experience a rapid loss of weight which shows that more serious trouble is brewing for him, and

will lead him, if he be wise, to seek medical advice.

Another method of ascertaining whether one is overtraining may be recommended, on the same authority to those who are out of the way of obtaining competent and skilled counsel. The instrument known as the spirometer, by blowing into which one raises an immersed cylinder in much the same way as does the gas in a gas-holder, will form a useful test.

Let the man who thinks he may be over-training blow into this, not rapidly but steadily, and until he feels that his lungs are practically empty, before taking his daily exercise. After he has done so—whether the same be using clubs, dumb-bells, walking, running or fencing matters nothing—let him repeat the process two or three times, with an interval of at least 20 seconds between each trial.

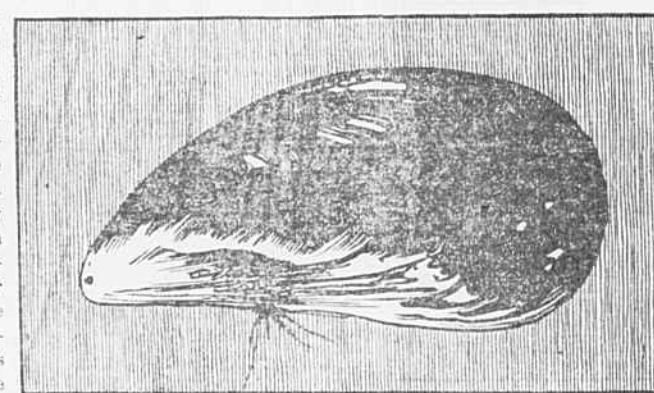
The attempt should in every case be prefaced by three equal and regular breaths, and if he finds that he can only, after exercise, raise a smaller weight than before—especially if the diminution be gradual—he may be sure that he is doing too much.

## The SEA MUSSEL, a NUTRITIOUS and Abundant but Little Used FOOD

THE sea mussel, one of the best and most abundant of sea foods, according to a bulletin recently issued by the United States bureau of fisheries, furnishes an example of waste of natural resources in America through failure to utilize it. In Europe the sea mussel is one of the most highly regarded shellfishes. Great Britain and Ireland consume about 35,000,000 pounds and little Holland over 65,000,000 pounds a year. In France about 400,000,000 pounds are produced annually and cooked in ways to delight the epicure. Yet in the United States practically no sea mussels are used except as bait or fertilizer.

Sea mussels are closely related to clams and oysters. They should not, however, be confounded with the fresh water mussel. As a nutritious and wholesome food they are equal to either clams or oysters, and many persons regard them as superior in flavor. They rarely fail to please the taste of the lover of sea foods, and the experiment of having them presented on the menus of some of the prominent hotels has met with immediate success.

Since they are abundant and easily taken, sea mussels are cheap. They are found in dense beds yet untouched, accessible to the markets, and easily reached by tongs and dredges. They can be placed on the markets at a lower cost than can either oysters or clams, and a bar-



A Peck of Sea Mussels in the Shell Will Supply All of the Meat Required for a Meal for Ten Persons.

rel of mussels contains more edible material than a barrel of oysters. The quantity of actual nutrient contained in the edible portions (the meat and liquor) of mussels is slightly greater than in oysters and clams, and the mussel therefore contains at least as much food, pound for pound, as is found in related shellfish in common use. As the shells are thinner, a bushel of mussels contains considerably more foodstuff than an equal quantity of oysters.

A peck of sea mussels in the shell will supply all of the meat required for a meal for ten persons.

Sea mussels are among the most easily digestible of foods, as has been demonstrated by the experience of consumers. Persons of weak digestion have found that they can eat sea mussels with impunity

when meats cause them to suffer.

Sea mussels possess the advantage of being in season when oysters are out of season. But comparatively few oysters are marketed from April to September, and this is the season at which mussels are at their best on the coast of the New England and middle Atlantic states.

Sea mussels are found on the Atlantic coast from the Arctic ocean to North Carolina, and on the Pacific coast as far south as San Francisco. Along the shore of New England, New York and New Jersey they exist in beds of great productivity.

As in the case of all animal foods, there are conditions under which sea mussels should not be gathered or eaten. Dead or stale mussels are apt to contain the same dangerous

decomposition products, ptomaines, as are found in other stale or putrefying animal foods. They should be alive when purchased, and this can be determined by observing if the shells are closed. If the shells gap the mussels are either dead or weak and possibly dying, and should not be used.

Mussels, like oysters, should not be used from sewage-polluted waters and, therefore, should not be taken from the vicinity of towns or on densely inhabited shores. They should not be taken from pilings, rocks, or shores exposed at low water, as in such locations they may become polluted or the liquor may become slightly decomposed by exposure to the warm air and sun.

For use in the fresh state, mussels should be purchased in the shell, and consumers should be careful to wash them well before cooking. The only inedible part, except the shell, is the little tuft of black hairs known as the byssus, or beard, which is readily detached after cooking.

Canned mussels of good quality, preserved either in their own juice or pickled in vinegar and spices, are now prepared by a few firms on both Atlantic and Pacific coasts. Thus prepared they retain their tenderness and most of their natural flavor. Mussels may be cooked in the same ways as oysters and

## WHAT Produces HEAT of the SUN

IF we could build up a solid column of ice from the earth to the sun, 2½ miles in diameter, spanning the intervening distance of 93,000,000 miles, and if the sun should concentrate his entire power upon it, it would dissolve in a single second, according to a calculation made by Prof. Young. To produce this enormous amount of heat would require the hourly burning of a layer of anthracite more than 19 feet thick over the entire surface of the sun. If the sun were composed of solid coal and we derived our heat from the burning of that coal the sun would burn out in less than 5000 years. Since the earth is millions

of years old the sun cannot be burning. Its heat must be generated in some more persistent way. The German physicist Helmholtz was the first to explain satisfactorily what keeps the sun hot. The sun is not burning; it is heated to the glowing point like a piece of white hot iron. Helmholtz found that if we suppose the sun to be contracting by only 250 feet a year we would receive our present amount of heat. In other words heat is being literally squeezed out of the sun.

Prof. Newcomb estimated that when the squeezing process has continued for about 7,000,000 years, the sun will be one-half its present size.

## How SCIENCE Makes HENS Lay SELF-PRESERVING Eggs

DR. OSCAR RIDDLE of the Carnegie Institution undertook in a leisurely moment to see if he could not make a hen lay an egg which should be self-preserving. He succeeded very well.

By his method the hen was fed utrotropin, administered in capsules at the rate of less than a dram a day. Utrotropin is deposited in the egg, where it changes into formalin, a well known preservative.

Eggs laid within 24 hours after the

first dosing, as well as those laid five days after, were sufficiently affected to be preserved. Dr. Riddle tested the keeping power of the eggs in comparison with those from untreated hens under particularly severe circumstances.

Eggs of both varieties laid in the month of July were allowed to stand in a temperature varying from 78 degrees above zero to 25 below. By the middle of September the difference between the two kinds of eggs

could be easily detected; by the middle of November all the eggs from undosed hens were spoiled while those from utrotropin-fed hens were still edible, although they had lost some of their bulk of water.

There is an extraordinary echo in the Cathedral at Pisa. If you sing two notes there is no reverberation, but if you sing three they are taken up, swelled and prolonged into a beautiful harmony.